Airport Navigation Aid Database Application 2.0 (AIRNAV 2.0)

Glossary

Revision History

#	Version	Date	Description	By
1	V01R00	12/20/2007	First Version of the Document	Frances K. Hubbard / Vishal Maheshwari

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1 Introduction

This document provides a common reference for terminology related to the AIRNAV project.

2 Standardized Terminology Definitions

2.1 Airport / Heliport

An airport/heliport is a facility where aircraft such as airplanes and helicopters can take off and land. An airport minimally consists of one runway or helipad (for helicopters), but other common components are hangars and terminal buildings.

AIRNAV 2.0 system will be the repository of aeronautical data related to airports, runways, lightings, NAVAID and their components, obstacles, no transgression zones, monitors, etc. Airports related data is one of the most important aeronautical data as the aeronautical data related to runways, lightings, etc is directly or indirectly related to airports data. Airports data forms the base data over which other aeronautical data is layered.

There are different categories of airport / heliport site based on the purpose of their use:

1. Airport
2. Heliport
3. Seabase
4. STOLport
5. Balloonport

Seabase: A loosely defined term that refers to a collection of ships at sea conducting operations that enable forces to operate ashore without a large logistics footprint. Such an operation may require a wide variety of ships to transfer cargo such as pallets, containers, and vehicles to one another. In AIRNAV 2.0, a Seabase will be handled as an airport with a possibility of multiple runways.

STOLport: An airport designed with STOL (Short Take-Off and Landing) operations in mind, normally having a short single runway. STOLports are popular in places like Alaska and Northern Canada where space for runways is limited. STOLports are normally used for local aviation and limited commercial operations. A STOLport usually has a runway shorter than 1,000 meters. This is not always the case. Larger STOLports like the London City Airport have runways that are longer than 1,000 meters. In AIRNAV 2.0, a STOLport will be handled as an airport with a possibility of multiple runways or helipads.

Balloonport: A landing area for helium balloons. In AIRNAV 2.0, a balloonport will be handled as a Heliport / Helipad.

2.2 Landing/Air Strip, Runway and Helipad

An elongated piece of land which can be safely used as a place for an airplane to land or take-off can be designated as Landing Strip or Air Strip. The two ends of a landing strip define 2 different runways. The runways are identified by a runway number and an indicator of relative position like 12L, 18R, etc. Here L stands for Left and R stands for Right. Another position is identified by the indicator C for Center. The difference in the number of the two ends of a landing strip is always 18 like 14L and 32R.

In AIRNAV 2.0 documentation, the pair of runway ends on a landing strip are called as AER and SER.

A circular piece of land which can be safely used as a place for a helicopter to land or take-off can be designated as Helipad. Two ends of a landing strip can also be sometimes used as two different helipads. Helipad is analogous to runway in the context of heliport vis-à-vis an airport.

2.3 NAVAID and Components

A navigational aid or NAVAID for short is any sort of marker which aids the traveler in navigation. In the context of AIRNAV system, it can be defined as "Any device external to an aircraft specifically intended to assist navigators in determining their position or safe course, or to warn them of dangers or obstructions to navigation. It may be a visual or electronic device, on ground or airborne, which provides point-to-point guidance information or position data to aircraft in flight." NAVAID systems are broadly classified into following two categories:

1. Precision NAVAID system
2. Non-Precision NAVAID system

Each NAVAID system may consist of one or more components. Some of these components are required for a NAVAID system to go operational, others may be optional. A NAVAID system may be a component for another NAVAID system.

Some of these NAVAID systems always exist in relation to a combination of airport and runway; others are not related to any combination of airport and runway.

Following are the different types of NAVAID systems for which the data will be maintained in AIRNAV system:

#	Name	Acronym	Type	Tied to Runway
1	Air Route Surveillance Radar	ARSR	Non Precision	No
2	Airport Surveillance Radar	ASR	Non Precision	No
3	Direction Finder	DF	Non Precision	No
4	Distance Measuring Equipment	DME	Non Precision	No
5	FAN Marker Beacon	FAN	Non Precision	No
6	Instrument Landing System	ILS	Precision	Yes
7	Localizer System	LOC	Non Precision	Yes
8	Microwave Landing System	MLS	Precision	Yes
9	Microwave Scan Beam Landing System	MSBLS	Precision	Yes
10	Non-directional Radio Beacon	NDB	Non Precision	No
11	Precision Approach Radar	PAR	Precision	Yes
12	Simplified Directional Facility	SDF	Non Precision	Yes
13	Secondary Radar	SECRA	Non Precision	No
14	Tactical Air Navigation	TACAN	Non Precision	No
15	Transponder Landing System	TLS	Precision	Yes
16	VOR with DME	VDME	Non Precision	No
17	VHF Omni-directional Range	VOR	Non Precision	No
18	VOR with TACAN	VORTAC	Non Precision	No
19	VOR Test Facility	VOT	Non Precision	No

2.4 ARSR

Air Route Surveillance Radar (ARSR) is a category of surveillance radars. ARSR is a long-range radar system designed primarily to provide a display of aircraft locations over large areas.

Component Name	Component Acronym	Required / Optional
Air Route Surveillance Radar	ARSR	Required
Secondary Radar	SECRA	Optional

2.5 ASR

Airport Surveillance Radar (ASR) is a category of surveillance radars. ASR is designed to provide relatively short-range coverage in the general vicinity of an airport and to serve as an expeditious means of handling terminal area traffic through observation of precise aircraft locations on a radarscope. The ASR can also be used as an instrument approach aid.

Component Name	Component Acronym	Required / Optional
Airport Surveillance Radar	ASR	Required
Secondary Radar	SECRA	Optional

2.6 DF

Direction Finder (DF) is a VHF/UHF radio receiver equipped with a directional sensing antenna used to take bearings on a radio transmitter. Specialized radio direction finders are used in aircraft as air navigation aids. Others are ground-based, primarily to obtain a "fix" on a pilot requesting orientation assistance or to locate downed aircraft.

Component Name	Component Acronym	Required / Optional
Direction Finder	DF	Required

2.7 DME

Distance Measuring Equipment (DME) system is a transponder-based radio navigation technology that measures distance by timing the propagation delay of VHF or UHF radio signals.

In the operation of DME system, paired pulses at a specific spacing are sent out from the aircraft (this is the interrogation) and are received at the ground station. The ground station (transponder) then transmits paired pulses back to the aircraft at the same pulse spacing but on a different frequency. The time required for the round trip of this signal exchange is measured in the airborne DME unit and is translated into distance (nautical miles) from the aircraft to the ground station.

Component Name	Component Acronym	Required / Optional
Distance Measuring Equipment	DME	Required

2.8 FAN

FAN Marker Beacon (FAN) is a type of radio beacon, the emissions of which radiate in a vertical, fan-shaped pattern. The signal can be keyed for identification purposes. Radio Beacon is a radio transmitter, which emits a distinctive or characteristic signal used for the determination of bearings, courses, or location.

Component Name	Component Acronym	Required / Optional
FAN Marker Beacon	FAN	Required

2.9 ILS

Instrument Landing System (ILS) is designed to provide an approach path for exact alignment and descent of an aircraft on final approach to a runway.

The ground equipment consists of two highly directional transmitting systems and, along the approach, three (or fewer) marker beacons. The directional transmitters are known as the localizer and glide slope transmitters.

The system may be divided functionally into three parts:

1. Guidance Information – Localizer, Glideslope

2. Range Information – Marker Beacon, DME
3. Visual Information – Approach Lights, Touchdown and Centerline Lights, Runway Lights.

Compass locators located at the Outer Marker (OM) or Middle Marker (MM), may be substituted for marker beacons. DME, when specified in the procedure, may be substituted for the OM.

Where a complete ILS system is installed on each end of a runway; (i.e., the approach end of Runway 4 and the approach end of Runway 22) the ILS systems are not in service simultaneously.

There are three categories of ILS (higher the category, better is the accuracy of the ILS) which support similarly named categories of operation. A category II and III ILS systems may be limited to category I use only due to airport, runway, and other limitations.

- Category I
- Category II
- Category III is further subdivided
    - Cat IIIa
    - Cat IIIb
    - Cat IIIc

Component Name	Component Acronym	Required / Optional
Localizer	LOC	Required
Glideslope	GS	Required
Distance Measuring Equipment	DME	Optional
Marker Beacon – Outer	MBO (OM)	Optional
Marker Beacon – Middle	MBM (MM)	Optional
Marker Beacon – Inner	MBI (IM)	Optional
Locator Outer Marker	LOM	Optional
Locator Middle Marker	LMM	Optional
Locator Inner Marker	LIM	Optional

2.10 LOC

Localizer (LOC) provides runway centerline guidance to aircraft. Localizers may exist in stand-alone instrument approach installations and are not always part of an Instrument Landing System (ILS). The localizer antenna is usually located at the stop end of the runway. The approach course of the localizer is called the front course. The course line in the opposite direction to the front course is called the back course.

Component Name	Component Acronym	Required / Optional
Localizer	LOC	Required
Distance Measuring Equipment	DME	Optional
Marker Beacon – Outer	MBO (OM)	Optional
Marker Beacon – Middle	MBM (MM)	Optional
Marker Beacon – Inner	MBI (IM)	Optional
Locator Outer Marker	LOM	Optional
Locator Middle Marker	LMM	Optional

2.11 MLS

Microwave Landing System (MLS) is an aircraft landing-guidance system that operates at microwave frequencies and provides deviations from the landing runway centerline using time-referenced scanning beam (TRSB) technology. The MLS was standardized in 1988 and approved for use in international civil aviation. It is an all-weather, precision landing system originally

intended to replace or supplement the Instrument Landing System (ILS). MLS has a number of operational advantages, including a wide selection of channels to avoid interference with other nearby airports, excellent performance in all weather, and a small "footprint" at the airports.

Component Name	Component Acronym	Required / Optional
Azimuth	AZ	Required
Elevation	ELEV	Required
Distance Measuring Equipment	DME	Required
Back Azimuth	BAZ	Optional

2.12 MSBLS

Microwave Scanning Beam Landing System (MSBLS) is designed to provide azimuth and elevation angles and distance information exclusively to NASA's Space Transportation System (STS) Shuttle Orbiter during final approach and landing at selected landing sites. It acts like a homing beacon for Space Shuttle orbiters returning to Earth. As an orbiter nears the runway, the system relays information to the pilot such as the vehicle's angle of approach and distance to touchdown, guiding it to a perfect landing.

Component Name	Component Acronym	Required / Optional
Azimuth	AZ	Required
Elevation	ELEV	Required
Distance Measuring Equipment	DME	Required

2.13 NDB

Non-directional Radio Beacon (NDB) is a low or medium frequency radio beacon that transmits non-directional signals whereby the pilot of an aircraft properly equipped can determine bearings and "home" on the station. NDB is mostly used for instrument approaches. In precision approaches, there may be a NDB co-located with the Outer Marker (OM). The marker is then referred as a Locator Outer marker (LOM).

Component Name	Component Acronym	Required / Optional
Non-directional Radio Beacon	NDB	Required
Distance Measuring Equipment	DME	Optional
Marker Beacon	MB	Optional

2.14 PAR

Precision Approach Radar (PAR) is designed for use as a landing aid rather than an aid for sequencing and spacing aircraft to provide lateral and vertical guidance to an aircraft pilot for landing up to the missed approach point. PAR equipment may be used as a primary landing aid, or it may be used to monitor other types of approaches. It is designed to display range, azimuth, and elevation information. It is similar to an instrument landing system (ILS) but requires control instructions. One type of instrument approach that can make use of PAR is the ground-controlled approach (GCA).

Component Name	Component Acronym	Required / Optional
Precision Approach Radar	PAR	Required

2.15 SDF

Simplified Directional Facility (SDF) provides a final approach course similar to that of the ILS localizer. It does not provide glide slope information. The approach techniques and procedures used in an SDF instrument approach are essentially the same as those employed in executing a

standard localizer approach except the SDF course may not be aligned with the runway and the course may be wider, resulting in less precision.

Component Name	Component Acronym	Required / Optional
Simplified Directional Facility	SDF	Required
Distance Measuring Equipment	DME	Optional
Marker Beacon – Outer	MBO (OM)	Optional
Marker Beacon – Middle	MBM (MM)	Optional
Marker Beacon – Inner	MBI (IM)	Optional
Locator Outer Marker	LOM	Optional
Locator Middle Marker	LMM	Optional

2.16 SECRA

Secondary Radar (SECRA) is a radar system in which the object to be detected is fitted with cooperative equipment in the form of a radio receiver/transmitter (transponder). Radar pulses transmitted from the searching transmitter/receiver (interrogator) site are received in the cooperative equipment and used to trigger a distinctive transmission from the transponder. This reply transmission, rather than a reflected signal, is then received back at the transmitter/receiver site for processing and display at an air traffic control facility.

Component Name	Component Acronym	Required / Optional
Secondary Radar	SECRA	Required

2.17 TACAN

Tactical Air Navigation (TACAN) is a navigation system used by military aircraft. It provides the user with a distance and bearing from a ground station. It is a more accurate version of the VHF Omni-directional Range / Distance Measuring Equipment (VOR/DME) system that provides range and bearing information for civil aviation. At VORTAC facilities, the DME portion of the TACAN system is available for civil use. TACAN has 2 receivers: Distance Measuring Equipment (DME) and Azimuth (AZ).

Component Name	Component Acronym	Required / Optional
TACAN	TACAN	Required

2.18 TLS

Transponder Landing System (TLS) tracks and provides landing approach guidance to an individual aircraft returning an assigned transponder identification code. TLS guidance signals emulate ILS signals that would exist at the current position of the tracked aircraft. Another aircraft not being tracked that tunes into the TLS localizer and glide slope channel will receive the guidance intended for the target aircraft, not valid guidance for its position in the airspace.

It is an all-weather, precision landing system that uses existing airborne transponder and ILS equipment to create a precision approach at a location where an ILS would normally not be available.

Component Name	Component Acronym	Required / Optional
Apparent Localizer	APLOC	Required
Apparent Glideslope	APGS	Required
Distance Measuring Equipment	DME	Optional
Marker Beacon – Outer	MBO (OM)	Optional
Marker Beacon – Middle	MBM (MM)	Optional
Marker Beacon – Inner	MBI (IM)	Optional
Locator Outer Marker	LOM	Optional

Locator Middle Marker	LMM	Optional

2.19 VDME

VOR with DME (VDME) is a single facility hosting both VOR and DME systems.

Component Name	Component Acronym	Required / Optional
VHF Omni-directional Range	VOR	Required
Distance Measuring Equipment	DME	Required

2.20 VOR

VHF Omni-directional Radio Range (VOR) is a type of radio navigation system for aircraft. VORs broadcast a VHF radio composite signal including the station's Morse code identifier (and sometimes a voice identifier), and data that allows the airborne receiving equipment to derive the magnetic bearing from the station to the aircraft (direction from the VOR station in relation to the earth's magnetic North). This line of position is called the "radial" in VOR parlance. The intersection of two radials from different VOR stations on a chart allows for a "fix" or specific position of the aircraft.

Component Name	Component Acronym	Required / Optional
VHF Omni-directional Range	VOR	Required

2.21 VORTAC

VOR with TACAN (VORTAC) is a single facility hosting both VOR and TACAN systems. Sometimes, only the DME portion of TACAN may be used along with VOR to work as a VDME system.

Component Name	Component Acronym	Required / Optional
VHF Omni-directional Range	VOR	Required
Tactical Navigation	TACAN	Required

2.22 VOT

A VOT is a low-power Omni station located on many of the mid-to-large size airports. A VOT differs from a standard VOR in that it transmits only a single radial, the 360° radial.

Component Name	Component Acronym	Required / Optional
VOR Test Facility	VOT	Required

2.23 Temporality

This is also known as Data Model and State within AIRNAV context. Data stored in the AIRNAV system will be defined according to its operational role:

- **Future Model:** All data representing a 'proposed' state falls into this category. The FPO Specialist creates data in the Future Model when performing an IP Feasibility Study or Airport Airspace Analysis.
- **Publication Model:** All data that is part of the NFPO production leading to publication of an instrument procedure.
- **Test Model:** All data supported by the AIRNAV Data Specialist for Flight Check testing, research, and development purposes.

Data in both Future and Publication model are version controlled. Each data object is assigned a machine generated Control Number that serves as its unique identifier. Furthermore, a Version Number is assigned to distinguish the version of the object.

Data objects in the Publication Model are tracked with respect to their place in the production process, i.e., their Production State (or Status):

- **Working** – When a data object is first created. It marks proposed, unapproved data.
- **Pending** – When the Data Specialist has validated the task by which the data object was created, signaling that it is ready for review.
- **Active** – After successful flight inspection and instrument procedure has been published. Note that supporting aeronautical data for an instrument procedure (e.g. NAVAIDs) may have a commissioning date that precedes the instrument procedure publication date. This state means that the data object is in operation within the NAS. Data in this state is unchangeable. There is only one active record for any aeronautical object.
- **History** – Data is no longer active. This state is set upon retirement of this version of the data item from the NAS; however, there may still be published artifacts that reference this version. For example, a flight procedure that references a fix that has been altered by adding another facility – the initial fix is still valid and the change does not alter the instrument procedure.

The IPDS Application enables the Operator to retrieve and filter data from AVNIS databases based on model (excluding Test Model) and Production State. When the Operator submits new data objects to the FAA Enterprise, it is determined if the data applies to the Future Model or the Publication Model by consulting the PTS Project referenced in the submission.

2.24 TORA

Take-off Run Available (TORA) is the length of runway declared available and suitable for the ground run of an airplane take–off.

2.25 TODA

Take-off Distance Available (TODA) is the length of the take–off run available plus the length of the clearway, if provided.

2.26 ASDA

Accelerate-Stop Distance Available (ASDA) is the length of the take–off run available plus the length of the stop way, if provided.

2.27 LDA

Landing Distance Available (LDA) is the length of runway which is declared available and suitable for the ground run of an airplane landing.

2.28 Obstacle

An obstacle is a construction which is remarkably higher than its surroundings, and which may cause harm or danger to air traffic.

2.29 DGPS Reference Point

A Differential Global Positioning System (DGPS) is an enhancement to Global Positioning System that uses a network of fixed ground based reference stations also known as DGPS Reference Points to broadcast the difference between the positions indicated by the satellite systems and the known fixed positions. These stations broadcast the difference between the

measured satellite pseudo-ranges and actual (internally computed) pseudo-ranges, and receiver stations may correct their pseudo-ranges by the same amount.

2.30 Monitor

Monitors are systems that track and alert controllers or pilots to potentially hazardous situations in an effective manner and with sufficient warning time for the situation to be resolved.

2.31 No Transgression Zone

The No Transgression Zone (NTZ) is a 2,000 foot wide zone, located equidistant between parallel runway final approach courses in which flight is not allowed.

2.32 APM

The Approach Path Monitor (APM) is a system used to signal deviations from the glide path.

2.33 FMA

Final Monitor Aid (FMA) is a high resolution color display that is equipped with the controller alert system hardware/software which is used in the precision runway monitor (PRM) system. The display includes alert algorithms providing the target predictors, a color change alert when a target penetrates or is predicted to penetrate the no transgression zone (NTZ), a color change alert if the aircraft transponder becomes inoperative, synthesized voice alerts, digital mapping, and like features contained in the PRM system.

2.34 PRM

Precision Runway Monitor (PRM) provides air traffic controllers with high precision secondary surveillance data for aircraft on final approach to parallel runways that have extended centerlines separated by less than 4,300 feet. High resolution color monitoring displays are required to present surveillance track data to controllers along with detailed maps depicting approaches and no transgression zone.

3 Abbreviations and Acronyms

Abbreviation / Acronym	Description
AER	Approach End of Runway
AFIS	Automated Flight Inspection System
AL	Approach Landing
APM	Approach Path Monitor
ARTCC	Air Route Traffic Control Center
ARP	Airport Reference Point
ASDA	Accelerate-Stop Distance Available
AVNIS	Aviation System Standards Integrated Services
BC	Back Course
CAT	Category
C/L	Centerline
ESV	Expanded Service Volume
FAA	Federal Aviation Administration
FAF	Final Approach Fix
FC	Front Course
FI	Flight Inspection
FMA	Final Monitor Aid
GPI	Ground Point Intercept
GS	Glide Slope
GTM	General Terrain Monitor
IAW	In Accordance With
ICAO	International Civil Aviation Organization
IFP	Instrument Flight Procedure
IFPA	Instrument Flight Procedure Automation
IFR	Instrument Flight Rules
IPDS	Instrument Procedure Development System
LCW	Localizer Course Width
LDA	Landing Distance Available
LDA	Localizer Type Directional Aid
LOC	Localizer
MagVar	Magnetic Variance
MAP	Missed Approach Point
MSL	Mean Sea Level
NACO	National Aeronautical Charting Office
NAS	National Airspace System
NAVAID	Navigational Aid
NFPO	National Flight Procedures Office
NOTAM	Notice To Airmen
NTS	NOTAM Tracking System
NTZ	No Transgression Zone
OCC	Operations Control Center
PAPI	Precision Approach Path Indicator
PRM	Precision Runway Monitor
PTS	Procedure Tracking System
RF	Radio Frequency
RPI	Runway Point Intercept
RVR	Runway Visual Range
SER	Stop End of Runway
SIAP	Standard Instrument Approach Procedure
TCH	Threshold Crossing Height

TDZ	Touchdown Zone
TH	Threshold
TODA	Take-off Distance Available
TORA	Take-off Run Available
TPP	Terminal Procedures Publication
VFR	Visual Flight Rules
VGSI	Visual Glide Slope Indicator
VMD	Video Map Display

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Vision

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1	V01R00	12/20/2007	First Version of the Document	Frances K. Hubbard / Gerald K. Thomas / Vishal Maheshwari

Table of Content

1 Introduction

1.1 Purpose

The purpose of this document is to articulate the business opportunity, problem statement, project position statement at high level and identify various stakeholders of AIRNAV. This document also provides project overview and summary of capabilities expected. The details of how the newer version of AIRNAV fulfills these needs are detailed in the use-case and supplementary specifications.

1.2 Scope

The scope of this document is to describe the vision of FAA – ATO about why upgrading the current AIRNAV system, to meet the new challenges faced by FAA – ATO in their day to day working, would be a worthwhile effort. The information provided within this document includes:

- Issues identified with current AIRNAV system
- How the upgrade of AIRNAV will address the identified issues?
- Identify the stakeholders and their interests

1.3 Abbreviations and Acronyms

Abbreviation / Acronym	Description
AFIS	Automated Flight Inspection System
AIXM	Aeronautical Information Exchange Model
ATO	Air Traffic Organization
AVN	Aviation System Standards
AVN-iSM	Customized RUP for AVN
DoD	U.S. Department of Defense
FAA	Federal Aviation Administration
FIOG	Flight Inspection Operations Group
FSEP	Facility, Service and Equipment Profile
GPD	Global Procedure Designer
IAPA	Instrument Approach Procedure Automation System
iCMM	Integrated Capability Maturity Model
IFP	Instrument Flight Procedure
IPDS	Instrument Procedures Development System
IT	Information Technology
MagVar	Magnetic Variance
NACG	National Aeronautical Charting Group
NAVAID	Navigational Aids
NFD	National Flight Database
NFPO	National Flight Procedures Office
NOTAM	Notice To Airmen
RUP	Rational Unified Process
TBD	To Be Decided

1.4 Overview

This document is organized in sections describing various facets of the project. Major sections are as described below:

Positioning: Describes the project positioning with respect to current issues.
Stakeholder and User Descriptions: Lists the identified stakeholders and users of the new system
Project Overview: Describes the context and expectations from the project
Project Features: Describes the high level capabilities of the new system that are necessary to deliver benefits to the users.
Other Project Requirements: Lists applicable standards, hardware or platform requirements, performance requirements, etc.

2 Positioning

2.1 Business Opportunity

The AIRNAV system needs to be upgraded to support the following AVN strategic objectives:

1. Establish National Flight Database (NFD) as the quality standard for validated navigational data.
2. Develop and Implement an Aeronautical management program that takes advantage of the principles of "data stewardship", web based systems, and integrated paper and digital development, and rapid revision concepts.
3. Integrate automated chart production and the Instrument Procedures Development System (IPDS).
4. Support the process of obstacle Evaluation and Change Evaluation for the Instrument Procedures Development System (IPDS).

2.2 Problem Statement

The problem of	1. Limited temporality of data for Airport / Runway and NAVAID data. 2. Supporting the Airport and NAVAID data needs for all organizations within AVN. 3. Non-compliance with FAA-ATO IT Standards
Affects	1. Flight Inspection Operations Group (FIOG) 2. National Flight Procedures Office (NFPO) 3. National Aeronautical Charting Group (NACG) 4. US Military
the impact of which is	1. Increased time and operating cost expenditures due to the manual entry and verification of aeronautical data 2. Increased probability of inaccurate data yielding flight safety hazards 3. Inability to fulfill the NFD Gold Standard goal for automation of the charting process lifecycle (procedure development → flight check → charting) 4. Inability to fulfill the documented requirements of various IFP applications used by the AVN organization 5. Inability to fulfill AVN's IPDS requirements (to replace IAPA) and DoD requirements (to replace GPD) 6. Increased maintenance time and cost due to non-compliance with FAA-ATO IT Standards
a successful solution would be	1. Inclusive of current AIRNAV system functionality 2. Compliant with documented IPDS requirements 3. Compliant with documented IFP requirements 4. Compliant with NFD Gold Standard 5. Compliant with FAA-ATO IT Standards

2.3 Project Position Statement

For	1. Aviation System Standards (AVN)

	2. Department of Defense (DoD)
Who	Maintain and access aeronautical data
The AIRNAV 2.0	Is an upgrade of the current AIRNAV system
That	1. Will deliver tighter data stewardship, storage and service oriented access of aeronautical data 2. Will ensure efficiencies in time, cost and quality for the storage, maintenance and access of aeronautical data 3. Will mitigate flight safety hazard risks due to inaccurate data manifestations 4. Will address NFD Gold Standard requirements for charting process lifecycle automation 5. Will fulfill documented IFP application requirements 6. Will fulfill documented IPDS requirements and DoD requirements 7. Will comply with FAA-ATO IT Standards
Unlike	The current PowerBuilder based AIRNAV System
Our project	Will deliver a system compliant with FAA-ATO IT Standards with following additional features: 1. Temporality of Airport, Runway and NAVAID data resulting in increased data flexibility, usability and accuracy 2. Data in a standard format to external users, applications and interfaces utilizing SOAP-based web services 3. Compliant with necessary business process and data requirements 4. Ease of use

3 Stakeholder and User Descriptions

3.1 Stakeholder Summary

Name	Description	Responsibilities	Involvement	Comment/ Issues
ASR	The ATC Spectrum Engineering Services supports web services to and from the ESV database (ESVMS)	Need to associate AIRNAV data to ASR/ESV data to support development efforts.	Provide documented ESV/ESVMS application and/or web service requirements Available for testing and sign-off on documented ESV/ESVMS application and/or web service requirements	
ATO IT	Information Technology group supports system design and maintenance of the AIRNAV 2.0 Project.	ATO IT is responsible for AIRNAV 2.0 development and supplying expertise for the application's project management, software design and achievement of documented requirements.	Attend JAD sessions, Data Architecture and Design, testing and/or use case modeling workshops. Develop and obtain Sign off on all related Rational Unified Process documentation required by AVN-iSM and iCMM Level 2. Create and implement test cases using quality assurance practices Work with all relevant stakeholders on Project Deliverable sign-off. Provide schedule and resource utilization (WBS) to Functional Project Manager for EVM reporting. Provide AIRNAV 2.0 documentation and verify compliance with Enterprise Architecture database standards, requirements and related needs.	
DoD	The Department of Defense (Army, Navy and Air Force) support flight procedure development, flight inspection and web services from Military	Requires aeronautical data availability to support IFP development requirements and flight inspection	Provide documented DoD application and/or web service requirements Available for testing and sign-off on documented DoD application and/or web service requirements	No direct requirements Subsumed by IPDS requirements

	applications.	operations		
FIOG	The Flight Inspection Operations Group supports the flight check of Instrument Flight Procedures and aeronautical data maintenance.	Will work directly with the developed application to maintain and verify any aeronautical data input. Use the aeronautical data to support flight inspection operations.	Attend JAD sessions, testing and/or use case modeling workshops Provide documented FOIG application and/or web service requirements Available for testing and sign-off on web services applicable to FOIG requirements and applications Review and sign off on relevant project deliverables	Subsumed by AIRNAV and IPDS requirements
NACO	The National Aeronautical Charting Office supports US civil aeronautical charting and flight information publications.	Requires aeronautical data availability to support US civil aeronautical charting and publication efforts.	Provide documented NACO application and/or web service requirements Available for testing and sign-off on web services applicable to NACO requirements and applications.	Subsumed by existing requirements
NFDC	The National Flight Data Center supports the publication of the National Flight Data Digest, Transmittal Letters (TLs) and one other aeronautical publication (TBD).	Requires aeronautical data available to support US civil aeronautical charting and publication	Provide documented NFDC application and/or web service requirements	Subsumed by AIRNAV and IPDS requirements
NFPO	The National Flight Procedures Office supports the development and quality control process for Instrument Flight Procedures.	Requires aeronautical data availability to support IFP development requirements	Attend JAD sessions, testing and/or use case modeling workshops Provide documented NFPO application and/or web service requirements Available for testing and sign-off on web services applicable to NFPO requirements and applications. Review and sign off on relevant project deliverables	Subsumed by AIRNAV and IPDS requirements

NGA	The National Geospatial-Intelligence Agency supports military aeronautical charting and ARINC coding standards.	Requires aeronautical data availability to support military aeronautical charting.	Provide documented NGA application and/or web service requirements Available for testing and sign-off on web services applicable to NGA requirements and applications.	Subsumed by IPDS requirements Will always access through IPDS

3.2 User Summary

Name	Description	Responsibilities	Stakeholder
Aeronautical Data Services Team	Data Specialist: experienced in internet and computer applications. Work with existing AIRNAV application built using PowerBuilder. High volume users of the system.	This user group is responsible for maintaining and verifying the aeronautical data to be stored in the application. They will be fully exploiting the sets of functionality provided within the application.	NFPO
Aeronautical Data Query Only User	Service Agreement Data Inquirer: Experienced in internet and computer applications. Work with existing AIRNAV application built using PowerBuilder. Low volume users of the system.	This user group is responsible for verifying and reporting on aeronautical data and will use a query only set of functionality within the application.	
External Systems	Service Agreement Data High volume users of the system.	Applications capable of calling web services provided by the application.	Refer section 3.3 External Systems for a complete listing of external systems

3.3 External Systems

Name	Description	Responsibilities	Involvement
APTS	The AVN Process Tracking System (APTS) supports process tracking work done to produce Instrument Flight Procedures and NOTAMs. Specifically, the NOTAM Entry System (NTS) and Procedure Tracking System (PTS).	Requires aeronautical data availability to support IFP development requirements	Provide documented APTS application and/or web service requirements Available for testing and sign-off on documented APTS application and/or web service requirements
ARINC	The ARINC System supports the National Flight Database (NFD) by delivering flight inspected procedure information.	Requires aeronautical data availability to support IFP development requirements	Provide documented IFP application and/or web service requirements Available for testing and sign-off on documented IFP application and/or web service requirements
ESVMS	The ATC Spectrum Engineering Services supports web services to and from the ESV database (ESVMS)	Need to associate AIRNAV data to ASR/ESV data to support development efforts.	Provide documented ESV/ESVMS application and/or web service requirements Available for testing and sign-off on documented ESV/ESVMS application and/or web service requirements
ENROUTE	The Enroute Database System will support the development of ENROUTE procedures.	Requires aeronautical data availability to support IFP.	Provide documented ENROUTE application and/or web service requirements
FIX	The FIX database application supports the development of FIXs in relation to Instrument Flight Procedures.	Requires aeronautical data availability to support IFP.	Provide documented FIX application and/or web service requirements
FOMS/ FIRPS	The Flight Operations Management System and the Flight Inspection Reporting System support Flight Inspection of Instrument Flight Procedures.	Requires aeronautical data availability to support IFP.	Provide documented FOMS/FIRPS application and/or web service requirements
IAPA	The Instrument Approach Procedure Application supports the automated design of Instrument Flight Procedures (being replaced by IPDS)	Requires aeronautical data availability emulating the existing AIRNAV database to support IFP.	Available for testing and sign-off on web services applicable to IAPA requirements and applications

IPDS	The Instrument Procedure Development System will support the automated design of Instrument Flight Procedures. (to replace IAPA)	Requires aeronautical data availability to support IFP.	Provide documented IPDS application and/or web service requirements Available for testing and sign-off on web services applicable to IPDS requirements and applications
Charting	The National Aeronautical Charting Office supports US civil aeronautical charting and flight information publications.	Requires aeronautical data availability to support US civil aeronautical charting and publication efforts.	Provide documented NACO application and/or web service requirements .
NASR	National Airspace System Resource Database Application supports the day-to-day management of NAS data used by the FAA to produce various aeronautical publications	NASR is the official source of aeronautical data provided to external proponents. May require support of data transfer services to and/or from the AirNav 2.0	Provide documented NASR application and/or web service requirements
NFDC	The National Flight Data Center supports the publication of the National Flight Data Digest, Transmittal Letters (TLs) and one other aeronautical publication (TBD).	Requires aeronautical data available to support US civil aeronautical charting and publication	Provide documented NFDC application and/or web service requirements Available for testing and sign-off on web services applicable to NFDC requirements and applications.
NGA	The National Geospatial-Intelligence Agency supports military aeronautical charting and ARINC coding standards.	Requires aeronautical data availability to support military aeronautical charting.	Provide documented NGA application and/or web service requirements
RADAR	The RADAR Database System will support the development of RADAR procedures. Will provide PDF versions of the necessary FAA RADAR Forms used for publication, etc.	Requires aeronautical data availability to support IFP development requirements.	Provide documented RADAR application and/or web service requirements Available for testing and sign-off on web services applicable to RADAR requirements and applications.

SIAP	The Standard Instrument Approach Procedure Database Application supports the development of Instrument Flight Procedures and provides PDF versions of the necessary FAA IFP Forms used for publication, etc.	Requires aeronautical data availability to support IFP development requirements.	Provide documented SIAP application and/or web service requirements Available for testing and sign-off on web services applicable to SIAP requirements and applications.
SIDS	The Standard Instrument Departure Database System will support the development of Departure Procedures.	Requires aeronautical data availability to support IFP development requirements.	Provide documented SIDS application and/or web service requirements.
STARS	The Standard Arrival Route Database System will support the development of Standard Arrival Routes (STARs).	Requires aeronautical data availability to support IFP development requirements.	Provide documented STARS application and/or web service requirements.
WAIVERS	The Waivers Database System supports the development of Waivers for procedures.	Requires aeronautical data availability to support IFP development requirements	Provide documented WAIVERS application and/or web service requirements

3.4 User Environment

The NFPO uses the current AIRNAV application and is a small experienced community demanding the flexibility and speed a web application provides. The user community is educated in Instrument Flight Procedure information and Airport and NavAid data requirements. All users are computer literate and most users have worked on a personal computer for more than 5 years and have moderately worked with Internet applications. The NFPO consists of a group of no more then 10 users at this time but staffing levels could increase or decrease as necessary. Other internal users include both NFPO Technical Support Users, who currently work with the NFPO Data Branch users on MagVar Rotations and users who will need query only access to the application (NFPO & FIOG). NACG users will also need to access the AIRNAV application to provide their "value added" information to Airport and Facility records. The NFPO and NACG users have the same experience with web based applications as the NFPO users do, but will add about 100 to 150 users who need read access and possibly around 30 to 50 users for data entry needs in later phases after Gold Standard is added. First phase will require 3 to 10 users with update capability.

Various external user applications require access to AIRNAV data via web services (PTS, NTS, SIAP, FIX, IPDS, FSEP, NGA applications, NACG applications, etc.). The user communities will be separated as internal users (users who require access to the actual application) and external users (users who require access to the application's data via web services).

3.5 Key Stakeholder or User Needs

Need	Priority	Concerns	Current Solution	Proposed Solutions
Database Architecture Upgrade	Must Have	Accuracy and stability of data.	Data temporality is not currently supported within the existing AIRNAV application other than through a pseudo airport workaround creating various other issues.	Develop database architecture ensuring application will deliver ability to store temporal data in easily maintained form.
Software Architecture Upgrade	Must Have	Easier Maintenance and Support of Software Changes.	Legacy PowerBuilder application must be installed on each PC and is difficult to maintain.	Develop a component-based J2EE web application accessible via internal FAA network with minimal administrative burden for application deployment/support.
AIXM GML Standard Support	Must Have	AIXM GML is World Excepted Schema for Aeronautical data exchange with XML.	Data exchanged through flat files and direct database access, AIXM GML web services are not currently supported.	Develop a service-oriented application supporting AIXM GML standards facilitating external application data requirements
User Interface Upgrade	Must Have	Ease of use	Existing AIRNAV PowerBuilder application provides the present user interface	Develop a user interface to automate and streamline the system's maintenance and verification processes for adding, updating and approving data
Business Data and Process Requirement Upgrade	Must Have	Accuracy and stability of data.	Manual processes are used to support the business related needs.	Automate business process and data requirements to replace existing manual processes and data captured outside the system.

3.6 Alternatives

Due to the nature of the aeronautical data and associated application constraints, there are no feasible alternatives to upgrading the current AIRNAV system.

4 Project Overview

4.1 Project Perspective

AIRNAV is one of the many systems used in the development of flight procedures. AIRNAV interfaces with number of other systems to meet these needs. These interfaces to other systems will be accomplished by exposing the data / functionality captured in AIRNAV through web services.

Following legacy systems would be minimally impacted:

- Instrument Approach Procedure Automation (IAPA)
- AFIS Database

They will continue to receive data as they do now.

Figure 4.1 represents the some of the many interfaces that will be required for the AIRNAV 2.0 application.

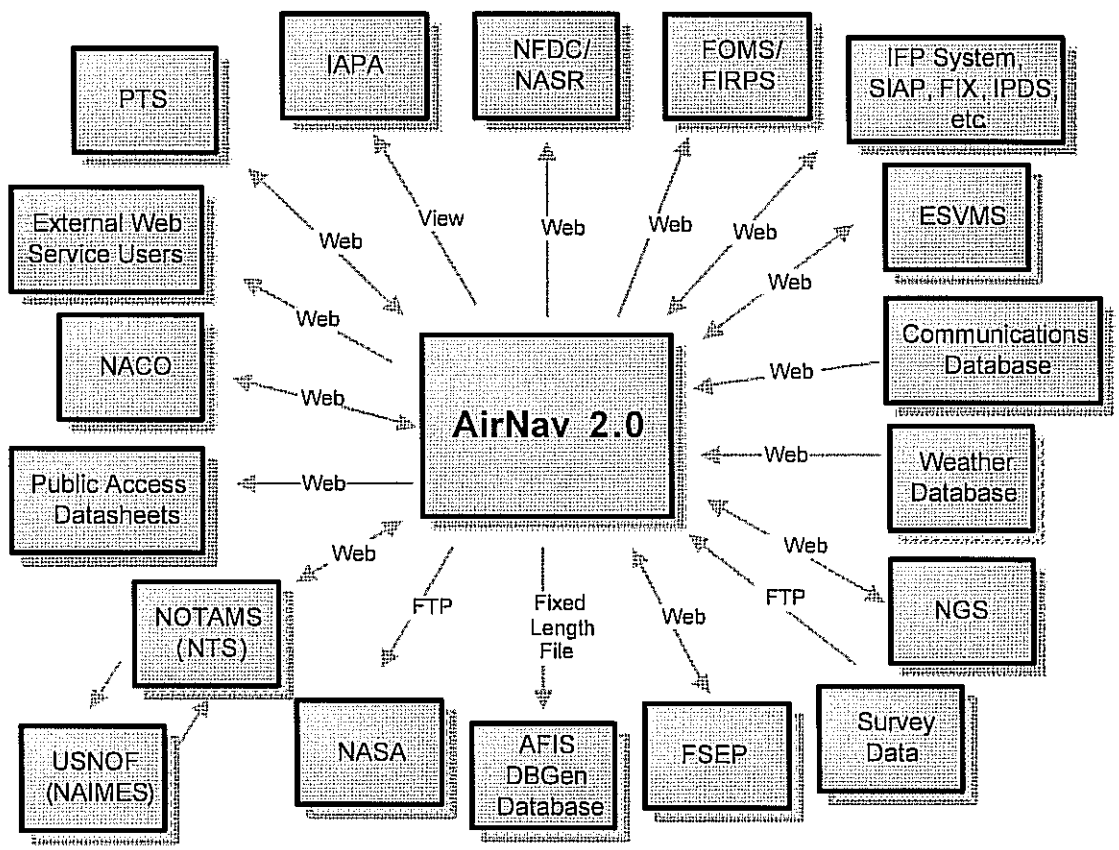


Figure 4.1

4.2 Summary of Capabilities

#	Benefit	Supporting Features
1	The Database Architecture upgrade will increase the accuracy of the data stored and will decrease maintenance costs of the AIRNAV application.	Database Architecture upgrade will support the temporality requirements of the aeronautical data. Database Architecture upgrade will follow the FAA-ATO IT Standard making it easier to maintain and reducing the maintenance cost.
2	The Software Architecture upgrade will increase the ability to reuse Enterprise components, thus decreasing the maintenance costs of the AIRNAV application as well as make it easy to update when necessary	Software Architecture upgrade will comply with the current FAA-ATO IT Standards. It will also allow the use existing hardware and software products available within ATO, thus reducing the maintenance cost.
3	AIXM GML Standard Support will support the FAA's architecture requirements for AIXM.	AIRNAV will have the capability built-in to support the worldwide AIXM standard.
4	User Interface upgrade will increase the accuracy of the data stored and decrease the time needed to maintain the data by providing a user friendly interface using web-based application data validation techniques.	User Interface upgrade will comply with the section 508 requirements.
5	Business Data and Process Requirement upgrade will increase the accuracy of the data stored and decrease the user time required for data maintenance.	Business Data and Process Requirement upgrade will provide integrated business rules for addition, maintenance, activation and deletion of aeronautical data and comply with the AVN standard operating procedures. Allow for easy customization of business processes in order to seamlessly adapt to fluid business requirements.
6,	The addition of Future data will allow the functionality of protecting airspace for planned changes to the NAS.	This will support the Obstacle Evaluation process and the automated Change Evaluation process being provided by the IPDS application.

4.3 Assumptions and Dependencies

Following are the assumptions made while documenting the vision for this effort:

- The new system would completely comply with the FAA ATO IT Standards in all respects.
- The Software Development Life Cycle would be as defined in the AVN iSM methodology.
- Requirements gathering will be done by a team internal to AVN and may be different from the development team.

Following are the dependencies identified while documenting the vision for this effort:

- Any changes in other systems with which AIRNAV is supposed to interface may necessitate changes in the vision of AIRNAV.
- The Communication and Weather modules provided by the new AIRNAV application will only replace the function of the existing application. When the Communication and

Weather applications are developed and provided by NACO, the functionality will be replaced.

- The Obstacle modules provided by the new AIRNAV application will only replace the function of the existing application. When the Obstacle Repository System (ORS) is provided by NACO, the functionality will be replaced.

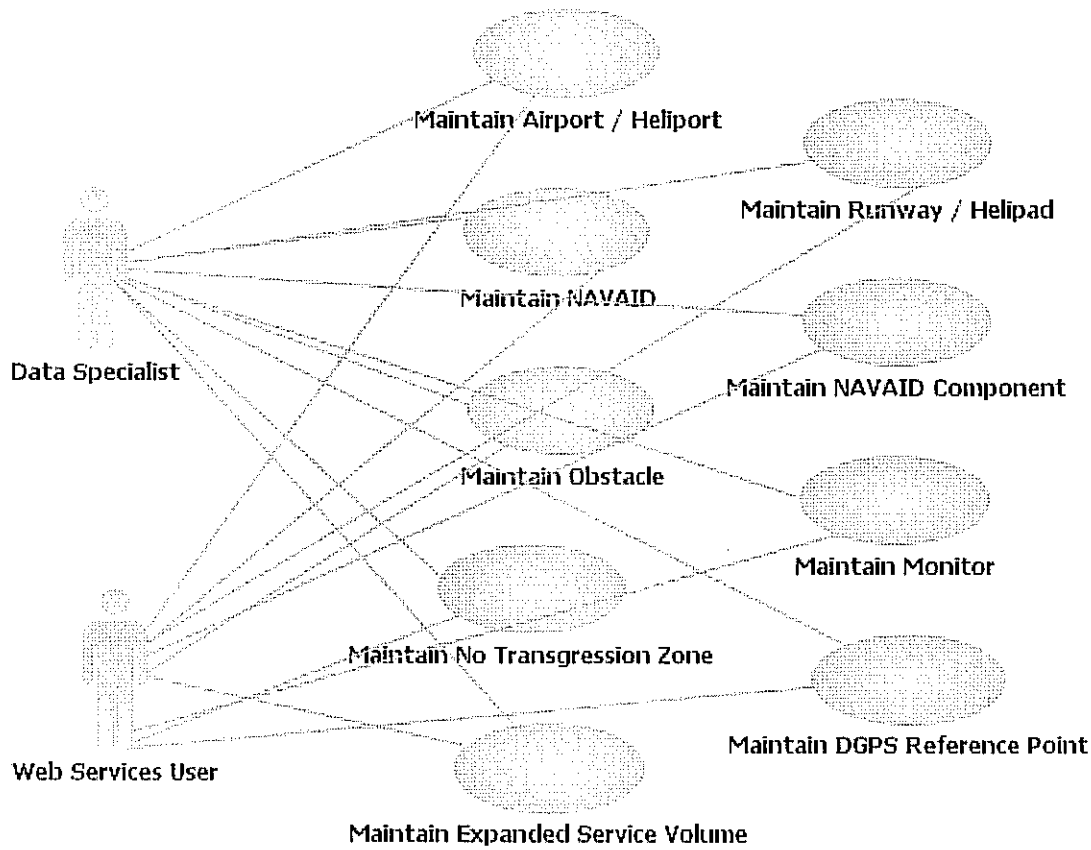
5 Project Features

Following are the key features identified for inclusion, but not limited to, in AIRNAV:

#	Feature Description
1	Replace the current AIRNAV functionality
2	Automate excel spreadsheet data calculations in the current AIRNAV system, using a Geodetic Calculator provided by IPDS.
3	Provide a user friendly web interface
4	Allow capturing the temporality of the aeronautical data, i.e. handling multiple Pending, Working, Future, History Records and one Active Record
5	Provide Web Services interface (IPDS, FOMS, APTS, IFP, NGS, etc.)
6	Provide audit trail capabilities such that information about the changes made to a record (who made the change and when the change was made, etc.) can be easily identified and are easily accessible
7	Support AIXM (Aeronautical Information Exchange Model) standard for international aeronautical data exchange. Provide the ability to import and export data formatted per AIXM standard.
8	Support data requirements for IPDS system
9	Provide views to support legacy systems (AFIS and IAPA).
10	Provide CRUD for Airport Information
11	Provide CRUD for NAVAID Information
12	Provide CRUD for Runway Information
13	Provide CRUD for Obstacles Information
14	Provide CRUD for DGPS Reference Point Information
15	Provide CRUD for Expanded Service Volume Information
16	Incorporate ESVMS Integration
17	Provide the capability of comparing two versions of all AIRNAV objects using the AIXM schema and provide a user friendly audit function.
18	Provide a graphic terrain display of data with the system providing the NAS points of interest. All AIRNAV data should be displayed by type.
19	Allow for working records to be created from an existing active or pending record.
20	Multi-level Online Help
21	Incorporate NOAA Magnetic Variance Integration

6 Use Cases

6.1 Use Case Model Survey



7 Other Project Requirements

The AIRNAV system is targeted for a UNIX platform Oracle application server and 10g database. Internet Explorer will be targeted for the AIRNAV system. The product will run on IE 6.0 and above as long as each release of IE is backwards compatible. The application will use the AIXM GML schema with the Oracle Enterprise Service Bus (ESB), as a web service interface, for all web service communication.

The AIRNAV system intends to use the Oracle Web Services Manager (WSM) for securing internet functionality. If single sign-on access is not ready, AIRNAV 2.0 will default to the Dashboard for user information.

The AIRNAV system will take a phased approach to developing all functionality needed to support stakeholder in this project:

- Phase 1 will implement the Airport and Runway functionality.
- Phase 2 will implement the NAVAID functionality.
- Phase 3 will implement Charting requirements.

Airport Navigation Aid Database Application 2.0 (AIRNAV 2.0)

DGPS Reference Point Use Cases and Business Rules

Revision History

#	Version	Date	Description	By
1	V00R01	11/21/2007	Draft Version of the Document	Frances K. Hubbard / Vishal Maheshwari
2	V01R00	12/20/2007	First Version of the Document	Frances K. Hubbard / Vishal Maheshwari

Table of Content

1 Introduction

This document fully describes the functionality of Maintain Differential Global Positioning System (DGPS) Reference Point module within the AIRNAV 2.0 system. These requirements are captured in the AVN-iSM Use Case format. It details, from a user's perspective, the needs the system must address to capture information related to maintaining the DGPS reference point information in AIRNAV 2.0 system.

1.1 Abbreviations and Acronyms

Refer the document AIRNAV - Glossary for abbreviations, acronyms and other general terminology used in the AIRNAV documentation.

2 Use Cases

The Maintain DGPS Reference Point module will include following use cases:

1. Search DGPS Reference Point
2. Add DGPS Reference Point
3. Edit DGPS Reference Point
4. View DGPS Reference Point
5. Delete DGPS Reference Point

The details of each of the above mentioned use cases are described in this document.

2.1 Use Case Specification: Search DGPS Reference Point

2.1.1 Brief Description

This use case describes the process of searching for a DGPS Reference Point record(s) in AIRNAV system.

2.1.2 Actors

Following are the actors for this use case:

1. Data Specialist

2.1.3 Pre – conditions

1. User must be logged in the system as one of the actors mentioned in section 2.1.2 above.
2. User must have the access privileges to search DGPS Reference Point information.

2.1.4 Basic Flow of Events

1. User invokes the 'Search DGPS Reference Point' functionality in the system.
2. System prompts the user to provide the search criteria for searching DGPS Reference Point, including but not limited to:
    a. Airport Identifier
    b. Physical Location
    c. Owner
    d. State – Listing.
    e. Country – Listing.
3. User enters a value for any combination of search criterion at the same time and selects to retrieve the records.
4. System displays a complete listing of DGPS Reference Point records, which satisfy the user entered search criteria, sorted by their identifier, state within identifier in a tabular format. The information displayed for each DGPS Reference Point will be:
    a. Airport Identifier
    b. Physical Location
    c. State
    d. Country
5. If no records satisfy the user entered search criteria, system displays an appropriate message to the user.

2.1.5 Alternate Flows

There are no alternate flows in this use case.

2.1.6 Sub – flows

There are no sub-flows for this use case.

2.1.7 Key Scenarios

There are no key scenarios for this use case.

2.1.8 Post – conditions

There are no post conditions for this use case.

2.1.9 Extension Points

There are no extension points for this use case.

2.1.10 Special Requirements

1. Refer to Business Rules section and Supplementary Specifications for requirements related to DGPS Reference Point.

2.1.11 Additional Information

There is no additional information for this use case.

2.1.12 Business Rules

1. For each DGPS Reference Point record in the search result, system will provide an ability, for users with appropriate access privileges, to directly navigate to:
    a. edit display of that DGPS Reference Point record
    b. view display of that DGPS Reference Point record
2. On the search result, the system will provide an ability to directly navigate to the add DGPS Reference Point display for users with appropriate access privileges.

2.2 Use Case Specification: Add DGPS Reference Point

2.2.1 Brief Description

This use case describes the process of adding a DGPS Reference Point record.

2.2.2 Actors

Following are the actors for this use case:

1. Data Specialist

2.2.3 Pre – conditions

1. User must be logged in the system as one of the actors mentioned in section 2.2.2 above.
2. User has conducted 'Search DGPS Reference Point' process and found no matching records.
3. User must have the access privileges to add DGPS Reference Point information.

2.2.4 Basic Flow of Events

1. User selects to navigate to the add display.
2. System prompts the user to enter the information, including but not limited to, for the DGPS Reference Point:
    a. Identifier
    b. Physical Location (City)
    c. Owner
    d. State
    e. Country
    f. Coordinates
        i. Latitude
        ii. Longitude
        iii. Elevation
        iv. Elevation Unit of Measure
        v. Horizontal Datum – Listing.
        vi. Vertical Datum – Listing
        vii. Ellipsoid Elevation
        viii. Ellipsoid Elevation Unit of Measure
        ix. Ellipsoid Horizontal Datum – Listing.
        x. Ellipsoid Vertical Datum - Listing
        xi. Ellipsoid Model
    g. Geoid Separation
    h. Description
3. User enters the information and selects to save the DGPS Reference Point record in the system.
4. System adds the DGPS Reference Point record and displays an appropriate message to the user.
5. If the system fails to add the DGPS Reference Point record with the information as entered by the user, system displays an appropriate message to the user.

2.2.5 Alternate Flows

There are no alternate flows in this use case.

2.2.6 Sub – flows

There are no sub-flows for this use case.

2.2.7 Key Scenarios

There are no key scenarios for this use case.

2.2.8 Post – conditions

1. A new DGPS Reference Point record is added to the system and is searchable.

2.2.9 Extension Points

There are no extension points for this use case.

2.2.10 Special Requirements

1. Refer to Business Rules section and Supplementary Specifications for requirements related to DGPS Reference Point.

2.2.11 Additional Information

There is no additional information for this use case.

2.2.12 Business Rules

1. System will provide an ability, for users with appropriate access privileges, to:
    a. navigate back to search display from the add display without adding a new record.
    b. clear the entire user entered information and any dependent information before record is added to the system.
2. The attribute 'Geoid Separation' will be geodetically calculated as the difference between Ellipsoid Elevation and Field Elevation

2.3 Use Case Specification: Edit DGPS Reference Point

2.3.1 Brief Description

This use case describes the process of editing an existing DGPS Reference Point record.

2.3.2 Actors

Following are the actors for this use case:

1. Data Specialist

2.3.3 Pre – conditions

1. User must be logged in the system as one of the actors mentioned in section 2.3.2 above.
2. User has conducted 'Search DGPS Reference Point' process and selected a DGPS Reference Point record for editing.
3. User must have the access privileges to edit DGPS Reference Point information.

2.3.4 Basic Flow of Events

1. User selects to navigate to edit display for a particular DGPS Reference Point record.
2. System displays the selected DGPS Reference Point record in the edit mode.
3. User makes the necessary changes to the record information and selects to save the changed DGPS Reference Point record in the system.
4. System saves the DGPS Reference Point record with the changed information and displays an appropriate message to the user.
5. If the system fails to save the DGPS Reference Point record with the changed information as entered by the user, system displays an appropriate message to the user.

2.3.5 Alternate Flows

There are no alternate flows for this use case.

2.3.6 Sub – flows

There are no sub-flows for this use case.

2.3.7 Key Scenarios

There are no key scenarios for this use case.

2.3.8 Post – conditions

1. A changed DGPS Reference Point record is saved to the system and is searchable based on the changed information.

2.3.9 Extension Points

There are no extension points for this use case.

2.3.10 Special Requirements

1. Refer to Business Rules and Supplementary Specifications for requirements related to DGPS Reference Point.

2.3.11 Additional Information

There is no additional information for this use case.

2.3.12 Business Rules

1. System will provide an ability, for users with appropriate access privileges, to
    a. navigate back to search display from the edit display without making any changes to the selected record.
    b. cancel the changes made by user to the record before the changed record is saved to the system.
2. Refer to Business Rules section of the use case: 'Add DGPS Reference Point' for other requirements.

2.4 Use Case Specification: View DGPS Reference Point

2.4.1 Brief Description

This use case describes the process of viewing an existing DGPS Reference Point record.

2.4.2 Actors

Following are the actors for this use case:

1. Data Specialist

2.4.3 Pre – conditions

1. User must be logged in the system as one of the actors mentioned in section 2.4.2 above.
2. User has conducted 'Search DGPS Reference Point' process and selected a DGPS Reference Point record for viewing.
3. User must have the access privileges to view DGPS Reference Point information.

2.4.4 Basic Flow of Events

1. User selects to navigate to view display for a particular DGPS Reference Point record.
2. System displays the selected DGPS Reference Point record in the view mode.

2.4.5 Alternate Flows

There are no alternate flows in this use case.

2.4.6 Sub – flows

There are no sub-flows for this use case.

2.4.7 Key Scenarios

There are no key scenarios for this use case.

2.4.8 Post – conditions

There are no post-conditions for this use case.

2.4.9 Extension Points

There are no extension points for this use case.

2.4.10 Special Requirements

1. Refer to Business Rules section and Supplementary Specifications for requirements related to DGPS Reference Point.

2.4.11 Additional Information

There is no additional information for this use case.

2.4.12 Business Rules

1. System will provide an ability, for users with appropriate access privileges, to:
    a. navigate back to search display from the view display.

2.5 Use Case Specification: Delete DGPS Reference Point

2.5.1 Brief Description

This use case describes the process of deleting an existing DGPS Reference Point record. The delete here refers to the physical deletion of the DGPS Reference Point record.

2.5.2 Actors

Following are the actors for this use case:

1. Data Specialist

2.5.3 Pre – conditions

1. User must be logged in the system as one of the actors mentioned in section 2.5.2 above.
2. User has conducted 'Search DGPS Reference Point' process and selected a DGPS Reference Point record for deleting.
3. User must have the access privileges to delete DGPS Reference Point information.

2.5.4 Basic Flow of Events

1. User selects to delete a particular DGPS Reference Point record from AIRNAV.
2. System deletes the selected DGPS Reference Point record and all child records from the system and displays an appropriate message to the user.
3. If the system fails to delete the selected DGPS Reference Point record, system displays an appropriate message to the user.

2.5.5 Alternate Flows

There are no alternate flows for this use case.

2.5.6 Sub – flows

There are no sub-flows for this use case.

2.5.7 Key Scenarios

There are no key scenarios for this use case.

2.5.8 Post – conditions

1. The selected DGPS Reference Point record will be deleted from the system.
2. The deleted DGPS Reference Point record will not be searchable in the system.

2.5.9 Extension Points

There are no extension points for this use case.

2.5.10 Special Requirements

1. Refer to Supplementary Specifications for requirements related to DGPS Reference Point.

2.5.11 Additional Information

There is no additional information for this use case.

Airport Navigation Aid Database Application 2.0 (AIRNAV 2.0)

Monitor and No Transgression Zone Use Cases and Business Rules

Revision History

#	Version	Date	Description	By
1	V01R00	12/20/2007	First Version of the Document	Frances K. Hubbard / Vishal Maheshwari

Table of Content

1 Introduction

This document fully describes the functionality of Maintain Monitor and Maintain No Transgression Zone modules within the AIRNAV 2.0 system. These requirements are captured in the AVN iSM Use Case format. It details, from a user's perspective, the needs the system must address to capture information related to maintaining the monitor and no transgression zone information in AIRNAV 2.0 system.

1.1 Abbreviations and Acronyms

Refer the document AIRNAV - Glossary for abbreviations, acronyms and other general terminology used in the AIRNAV documentation.

Use Cases

The Maintain Monitor and Maintain No Transgression Zone modules includes following use cases:

1. Search Monitor
2. Add Monitor
    a. APM
    b. FMA
    c. PRM
3. Edit Monitor
    a. APM
    b. FMA
    c. PRM
4. View Monitor
5. Delete Monitor
6. Search No Transgression Zone
7. Add No Transgression Zone
8. Edit No Transgression Zone
9. View No Transgression Zone
10. Delete No Transgression Zone

The details of each of the above mentioned use cases are described in this document.

1.2 Use Case Specification: Search Monitor

1.2.1 Brief Description

This use case describes the process of searching for a monitor record(s) in AIRNAV system.

1.2.2 Actors

Following are the actors for this use case:

1. Data Specialist

1.2.3 Pre – conditions

1. User must be logged in the system as one of the actors mentioned in section 2.1.2 above.
2. User must have the access privileges to search monitor information.

1.2.4 Basic Flow of Events

1. User invokes the 'Search Monitor' functionality in the system.
2. System prompts the user to provide the search criteria for searching monitor, including but not limited to:
    a. Type – Listing.
    b. Identifier
    c. Airport – Listing.
    d. State – Listing.
    e. Country – Listing.
3. User enters a value for any combination of search criterion at the same time and selects to retrieve the records.
4. System displays a complete listing of monitor records, which satisfy the user entered search criteria, sorted by their type, identifier within type and airport within identifier within type in a tabular format. The information displayed for each monitor will be:
    a. Type
    b. Airport
    c. Identifier
    d. State
    e. Country
5. If no user records satisfy the user entered search criteria, system displays an appropriate message to the user.

1.2.5 Alternate Flows

There are no alternate flows in this use case.

1.2.6 Sub – flows

There are no sub-flows for this use case.

1.2.7 Key Scenarios

There are no key scenarios for this use case.

1.2.8 Post – conditions

There are no post conditions for this use case.

1.2.9 Extension Points

There are no extension points for this use case.

1.2.10 Special Requirements

1. Refer to Business Rules section, Supplementary Specifications and individual monitor section in this document for requirements related to each monitor.

1.2.11 Additional Information

There is no additional information for this use case.

1.2.12 Business Rules

1. For each monitor record in the search result, system provides an ability, for users with appropriate access privileges, to directly navigate to:
    a. edit display of that monitor record.
    b. view display of that monitor record.
2. On the search result, the system provides an ability to directly navigate to the add monitor display for users with appropriate access privileges.

1.3 Use Case Specification: Add Monitor

1.3.1 Brief Description

This use case describes the process of adding a monitor record.

1.3.2 Actors

Following are the actors for this use case:

1. Data Specialist

1.3.3 Pre – conditions

1. User must be logged in the system as one of the actors mentioned in section 2.2.2 above.
2. User has conducted 'Search Monitor' process and found no matching records.
3. User must have the access privileges to add monitor information.

1.3.4 Basic Flow of Events

1. User selects to navigate to the add display.
2. System prompts the user to select a monitor from a listing of different types of monitors.
3. User selects a particular monitor type.
4. System prompts the user to enter the necessary information for the selected monitor type.
5. User enters the information and selects to save the monitor record in the system.
6. System adds the monitor record and displays an appropriate message to the user.
7. If the system fails to add the monitor record with the information as entered by the user, system displays an appropriate message to the user.

1.3.5 Alternate Flows

There are no alternate flows in this use case.

1.3.6 Sub – flows

1.3.6.1 Add VMD (Valid for PRM only)

1. User selects to add VMD information to the PRM information.
2. System prompts the user to enter the information, including but not limited to, for the VMD:
    a. VMD Identifier
    b. Type
    c. Upper MSL
    d. Lower MSL
    e. Coordinates
        i. Sequence Number
        ii. Latitude
        iii. Longitude
3. User enters the information and selects to save the VMD record in the system.
4. System adds the VMD record and displays an appropriate message to the user.
5. If the system fails to add the VMD record with the information entered by the user, system displays an appropriate message to the user.

1.3.6.2 Add AMZ (Valid for FMA only)

1. User selects to add AMZ information to the FMA information.

2. System prompts the user to enter the information, including but not limited to, for the AMZ:
    a. AMZ Identifier
    b. Type
    c. Upper MSL
    d. Lower MSL
    e. Coordinates
        i. Sequence Number
        ii. Latitude
        iii. Longitude
3. User enters the information and selects to save the AMZ record in the system.
4. System adds the AMZ record and displays an appropriate message to the user.
5. If the system fails to add the AMZ record with the information entered by the user, system displays an appropriate message to the user.

1.3.7 Key Scenarios

There are no key scenarios for this use case.

1.3.8 Post – conditions

1. A new monitor record is added to the system and is searchable.

1.3.9 Extension Points

There are no extension points for this use case.

1.3.10 Special Requirements

1. Refer to Business Rules section, Supplementary Specifications and individual monitor section in this document for requirements related to each monitor.

1.3.11 Additional Information

There is no additional information for this use case.

1.3.12 Business Rules

1. System will provide an ability, for users with appropriate access privileges, to:
    a. navigate back to search display from the add display without adding a new record.
    b. clear the entire user entered information and any dependent information before record is added to the system.

1.4 Use Case Specification: Edit Monitor

1.4.1 Brief Description

This use case describes the process of editing an existing monitor record.

1.4.2 Actors

Following are the actors for this use case:

1. Data Specialist

1.4.3 Pre – conditions

1. User must be logged in the system as one of the actors mentioned in section 2.3.2 above.
2. User has conducted 'Search Monitor' process and selected a monitor record for editing.
3. User must have the access privileges to edit monitor information.

1.4.4 Basic Flow of Events

1. User selects to navigate to edit display for a particular monitor record.
2. System displays the selected Monitor record in the edit mode.
3. User makes the necessary changes to the record information and selects to save the changed Monitor record in the system.
4. System saves the Monitor record with the changed information and displays an appropriate message to the user.
5. If the system fails to save the Monitor record with the changed information as entered by the user, system displays an appropriate message to the user.

1.4.5 Alternate Flows

There are no alternate flows to this use case.

1.4.6 Sub – flows

1.4.6.1 Edit VMD (Valid for PRM only)

1. User selects to edit VMD information to the PRM information.
2. System displays the VMD record in the edit mode.
3. User makes the necessary changes to the record information and selects to save the changed VMD record in the system.
4. System saves the VMD record with the changed information and displays an appropriate message to the user.
5. If the system fails to save the VMD record with the changed information as entered by the user, system displays an appropriate message to the user.

1.4.6.2 Edit AMZ (Valid for FMA only)

1. User selects to edit AMZ information to the FMA information.
2. System displays the AMZ record in the edit mode.
3. User makes the necessary changes to the record information and selects to save the changed AMZ record in the system.
4. System saves the AMZ record with the changed information and displays an appropriate message to the user.
5. If the system fails to save the AMZ record with the changed information as entered by the user, system displays an appropriate message to the user.

1.4.7 Key Scenarios

There are no key scenarios for this use case.

1.4.8 Post – conditions

1. A changed Monitor record is saved to the system and is searchable based on the changed information.

1.4.9 Extension Points

There are no extension points for this use case.

1.4.10 Special Requirements

1. Refer to Business Rules section, Supplementary Specifications and individual Monitor section in this document for requirements related to each Monitor.

1.4.11 Additional Information

There is no additional information for this use case.

1.4.12 Business Rules

1. System will provide an ability, for users with appropriate access privileges, to:
    a. navigate back to search display from the edit display without making any changes to the selected record.
    b. cancel the changes made by user to the record before the changed record is saved to the system.

1.5 Use Case Specification: View Monitor

1.5.1 Brief Description

This use case describes the process of viewing an existing Monitor record.

1.5.2 Actors

Following are the actors for this use case:

1. Data Specialist

1.5.3 Pre – conditions

1. User must be logged in the system as one of the actors mentioned in section 2.4.2 above.
2. User has conducted 'Search Monitor' process and selected a Monitor record for viewing.
3. User must have the access privileges to view monitor information.

1.5.4 Basic Flow of Events

1. User selects to navigate to view display for a particular Monitor system record.
2. System displays the selected Monitor system record in the view mode.

1.5.5 Alternate Flows

There are no alternate flows in this use case.

1.5.6 Sub – flows

There are no sub-flows for this use case.

1.5.7 Key Scenarios

There are no key scenarios for this use case.

1.5.8 Post – conditions

There are no post-conditions for this use case.

1.5.9 Extension Points

There are no extension points for this use case.

1.5.10 Special Requirements

1. Refer to Business Rules section, Supplementary Specifications and individual Monitor section in this document for requirements related to each Monitor.

1.5.11 Additional Information

There is no additional information for this use case.

1.5.12 Business Rules

1. System will provide an ability, for users with appropriate access privileges, to:
    a. navigate back to search display from the view display.

1.6 Use Case Specification: Delete Monitor

1.6.1 Brief Description

This use case describes the process of deleting an existing Monitor record. The delete here refers to the physical deletion of the Monitor system record.

1.6.2 Actors

Following are the actors for this use case:

1. Data Specialist

1.6.3 Pre – conditions

1. User must be logged in the system as one of the actors mentioned in section 2.5.2 above.
2. User has conducted 'Search Monitor' process and selected a Monitor record for deleting.
3. User must have the access privileges to delete monitor information.

1.6.4 Basic Flow of Events

1. User selects to delete a particular Monitor system record from AIRNAV.
2. System deletes the selected Monitor system record and all the child records from the system and displays an appropriate message to the user.
3. If the system fails to delete the selected Monitor system record, system displays an appropriate message to the user.

1.6.5 Alternate Flows

There are no alternate flows for this use case.

1.6.6 Sub – flows

There are no sub-flows for this use case.

1.6.7 Key Scenarios

There are no key scenarios for this use case.

1.6.8 Post – conditions

1. The selected Monitor system record will be deleted from the system.
2. The deleted Monitor system record will not be searchable in the system.

1.6.9 Extension Points

There are no extension points for this use case.

1.6.10 Special Requirements

1. Refer to Supplementary Specifications and individual Monitor section in this document for requirements related to each Monitor.

1.6.11 Additional Information

There is no additional information for this use case.

1.7 Use Case Specification: Search No Transgression Zone

1.7.1 Brief Description

This use case describes the process for searching No Transgression Zone record(s) in AIRNAV by a user.

1.7.2 Actors

Following are the actors for this use case:

1. Data Specialist

1.7.3 Pre-conditions

1. The user must be logged in the system as one of the actors mentioned in section 2.6.2 above.
2. User must have the access privileges to search No transgression Zone information.

1.7.4 Basic Flow of Events

1. User invokes the 'Search No Transgression Zone' functionality in the system.
2. System prompts the user to provide the search criteria for searching No Transgression Zone, including but not limited to:
    a. Identifier
3. User enters a value for search criterion and selects to retrieve the records.
4. System displays a complete listing of No Transgression Zone records, which satisfy the user entered search criteria, sorted by their identifier in a tabular format. The information displayed for each No Transgression Zone will be:
    a. Identifier
5. If no user records satisfy the user entered search criteria, system displays an appropriate message to the user.

1.7.5 Alternate Flows

There are no alternate flows for this use case.

1.7.6 Sub-flows

There are no sub-flows for this use case.

1.7.7 Key Scenarios

There are no key scenarios for this use case.

1.7.8 Post-conditions

There are no post conditions for this use case.

1.7.9 Extension Points

There are no extension points for this use case.

1.7.10 Special Requirements

1. Refer to Business Rules section and Supplementary Specifications for requirements related to No Transgression Zone.

1.7.11 Additional Information

There is no additional information for this use case.

1.7.12 Business Rules

1. For each No Transgression Zone record in the search result, system provides an ability, for users with appropriate access privileges, to directly navigate to:
    a. edit display of that No Transgression Zone record.
    b. view display of that no Transgression Zone record.
2. On the search result, the system provides an ability to directly navigate to the add No Transgression Zone display for users with appropriate access privileges.

1.8 Use Case Specification: Add No Transgression Zone

1.8.1 Brief Description

This use case describes the process of adding a new No Transgression Zone record by a user.

1.8.2 Actors

Following are the actors for this use case:

1. Data Specialist

1.8.3 Pre-conditions

1. User must be logged in the system as one of the actors mentioned in section 2.7.2 above.
2. User conducted 'Search No Transgression Zone' process and found no matching records.
3. User must have the access privileges to add No Transgression Zone information.

1.8.4 Basic Flow of Events

1. User selects to navigate to the add No Transgression Zone display.
2. System prompts the user to enter the information, including but not limited to, for the No Transgression Zone:
    a. NTZ Type
    b. Identifier
    c. Dist Centerline to Centerline
    d. Program Code- Listing.
    e. Runway Link - Multiple
    f. ILS Identifier
    g. Upper MSL
    h. Lower MSL
    i. Coordinates
        i. Sequence Number
        ii. Latitude
        iii. Longitude
        iv. Elevation
        v. Elevation Unit of Measure
        vi. Horizontal Datum
        vii. Vertical Datum
3. User enters the necessary information and selects to save the No Transgression Zone record in the system.
4. System adds the No Transgression Zone record and displays an appropriate message to the user.
5. ILS Identifier is pulled via a service from the linked runway for validation. If there is not an ILS on the runway, notify the user.
6. If the system fails to add the No Transgression Zone record with the information as entered by the user, system displays an appropriate message to the user.

1.8.5 Alternate Flows

There are no alternate flows in this use case.

1.8.6 Sub-flows

There are no sub-flows for this use case.

1.8.7 Key Scenarios

There are no key scenarios for this use case.

1.8.8 Post-conditions

1. A new No Transgression Zone record is added to the system and is searchable.

1.8.9 Extension Points

There are no extension points for this use case.

1.8.10 Special Requirements

1. Refer to Business Rules section and Supplementary Specifications for requirements related to No Transgression Zone.

1.8.11 Additional Information

There is no additional information for this use case.

1.8.12 Business Rules

1. System will provide an ability, for users with appropriate access privileges, to:
    a. navigate back to search display from the add display without adding a new record.
    b. clear the entire user entered information and any dependent information before record is added to the system.

1.9 Use Case Specification: Edit No Transgression Zone

1.9.1 Brief Description

This use case describes the process of editing a No Transgression Zone record.

1.9.2 Actors

Following are the actors for this use case:

1. Data Specialist

1.9.3 Pre – conditions

1. User must be logged in the system as one of the actors mentioned in section 2.8.2 above.
2. User has conducted 'Search No Transgression Zone' process and has selected a No Transgression Zone record for editing.
3. User must have the access privileges to edit No Transgression Zone information.

1.9.4 Basic Flow of Events

1. User selects to navigate to edit No Transgression Zone display.
2. System displays the selected No Transgression Zone record in the edit mode.
3. User makes the necessary changes to the record information and selects to save the changed No Transgression Zone record in the system.
4. System saves the No Transgression Zone record with the changed information and displays an appropriate message to the user.
5. If the system fails to save the No Transgression Zone record with the changed information as entered by the user, system displays an appropriate message to the user.

1.9.5 Alternate Flows

There are no alternate flows for this use case.

1.9.6 Sub – flows

There are no sub-flows for this use case.

1.9.7 Key Scenarios

There are no key scenarios for this use case.

1.9.8 Post – conditions

1. A changed No Transgression Zone record is saved to the system and is searchable based on the changed information.

1.9.9 Extension Points

There are no extension points for this use case.

1.9.10 Special Requirements

1. Refer to Business Rules section and Supplementary Specifications for requirements related to No Transgression Zone.

1.9.11 Additional Information

There is no additional information for this use case.

1.9.12 Business Rules

1. System will provide an ability, for users with appropriate access privileges, to
    a. navigate back to search display from the edit display without making any changes to the selected record.
    b. cancel the changes made by user to the record before the changed record is saved to the system.
2. Refer to Business Rules section of the use case: 'Add No Transgression Zone' for other requirements.

1.10 Use Case Specification: View No Transgression Zone

1.10.1 Brief Description

This use case describes the process of viewing an existing No Transgression Zone record by a user.

1.10.2 Actors

Following are the actors for this use case:

1. Data Specialist

1.10.3 Pre-conditions

1. User must be logged in the system as one of the actors mentioned in section 2.9.2 above.
2. User has conducted 'Search No Transgression Zone' process and has selected a No Transgression Zone record for viewing.
3. User must have the access privileges to view No Transgression Zone information.

1.10.4 Basic Flow of Events

1. User selects to navigate to view display for a particular No Transgression Zone record.
2. System displays the selected No Transgression Zone record in the view mode.

1.10.5 Alternate Flows

There are no alternate flows in this use case.

1.10.6 Sub – flows

There are no sub-flows for this use case.

1.10.7 Key Scenarios

There are no key scenarios for this use case.

1.10.8 Post – conditions

There are no post-conditions for this use case.

1.10.9 Extension Points

There are no extension points for this use case.

1.10.10 Special Requirements

1. Refer to Business Rules section and Supplementary Specifications for requirements related to No Transgression Zone.

1.10.11 Additional Information

There is no additional information for this use case.

1.10.12 Business Rules

1. System will provide an ability, for users with appropriate access privileges, to:
    a. navigate back to search display from the view display.

1.11 Use Case Specification: Delete No Transgression Zone

1.11.1 Brief Description

This use case describes the process of deleting an existing No Transgression Zone record by a user.

1.11.2 Actors

Following are the actors for this use case:

1. Data Specialist

1.11.3 Pre-conditions

1. User must be logged in the system as one of the actors mentioned in section 2.10.2 above.
2. User has conducted 'Search No Transgression Zone' process and selected a No Transgression Zone record for deleting.
3. User must have the access privileges to delete No Transgression Zone information.

1.11.4 Basic Flow of Events

1. User selects to delete a particular No Transgression Zone record from AIRNAV.
2. System deletes the selected No Transgression Zone record from the system and displays an appropriate message to the user.
3. If the system fails to delete the selected No Transgression Zone record, system displays an appropriate message to the user.

1.11.5 Alternate Flows

There are no alternate flows for this use case.

1.11.6 Sub – flows

There no sub-flows for this use case.

1.11.7 Key Scenarios

There are no key scenarios for this use case.

1.11.8 Post-conditions

1. The selected No Transgression Zone record will be deleted from the system.
2. The deleted No Transgression Zone record will not be searchable in the system.

1.11.9 Extension Points

There are no extension points for this use case.

1.11.10 Special Requirements

1. Refer to Supplementary Specifications for requirements related to No Transgression Zone.

1.11.11 Additional Information

There is no additional information for this use case.

2 Monitor Specific Business Rules

2.1 APM

1. Following information, including but not limited to, will be captured for APM in AIRNAV:
    a. General Information
        i. Alignment Type – Mandatory information. Listing.
        ii. Airport Identifier - Mandatory information. Listing.
        iii. Owner - Listing.
        iv. Airport Location – Non-editable.
        v. APM Identifier – Generated information.
            1. Airport Identifier
            2. Character
        vi. Program Code - Listing.
    b. Associated Systems
        i. NAVAID Identifier – Listing.
            1. NAVAID Type – Non-editable
            2. Status – Non-editable
            3. SIAP's at the Associated Runways – Non-editable
        ii. SIAP Link
        iii. Type – Non-editable.
        iv. Country – Non-editable.
        v. Status – Non-editable.
        vi. Association Type – Listing.
    c. Associated Runways
        i. Runway Number - Listing.
        ii. Status - Non-editable.
    d. Comments
        i. Priority
        ii. Topic – Listing.
        iii. Date
        iv. Remark
2. System will automatically populate the attribute 'Associated Systems' with a list of NAVAID Identifier based on the Airport Identifier selected by the user.
3. System will automatically populate following attributes based on the NAVAID Identifier selected by the user.
    a. 'Associated Systems → Type' with the NAVAID Type
    b. 'Associated Systems → Country' with the NAVAID Country
    c. 'Associated Systems → Status' with the NAVAID Status.
4. The attribute 'Associated Systems' will have following options (including, but not limited to):
    a. Primary
    b. Secondary
5. System will automatically populate the attribute 'Associated Runways → Status' based on the Runway Number selected by the user.

2.2 FMA

1. Following information, including but not limited to, will be captured for FMA in AIRNAV:
    a. General Information
        i. Airport Identifier – Mandatory information. Listing.
        ii. Owner - Listing.
        iii. Effective Date – Mandatory information. Listing.
        iv. Effective End Date
        v. Commissioned Date
        vi. Recommissioned Date
        vii. Data Source - Listing.
        viii. Equipment Type - Listing.
        ix. Monitor Frequency
        x. Antenna
            1. Type - Listing.
            2. Latitude
            3. Longitude
        xi. Airport - Non-editable
            1. Airport Identifier
            2. State
            3. Country
            4. Name
            5. Datum
    b. Active Monitored Zone (AMZ)
        i. AMZ
        ii. Type
        iii. Associated Runways
    c. No Transgression Zone (NTZ)
        i. AMZ
        ii. NTZ Identifier
        iii. Purpose
        iv. Program
        v. Distance CI CI
    d. Comments
        i. Priority
        ii. Topic – Listing.
        iii. Date
        iv. Remark

2.3 PRM

1. Following information, including but not limited to, will be captured for PRM in AIRNAV:
    a. General Information
        i. Airport Identifier – Mandatory information. Listing.
        ii. Owner - Listing.
        iii. Effective Date – Mandatory information. Listing.
        iv. Effective End Date
        v. Commissioned Date
        vi. Recommissioned Date
        vii. Data Source - Listing.
        viii. Equipment Type - Listing.
        ix. Monitor Frequency
        x. Antenna
            1. Type - Listing.
            2. Latitude
            3. Longitude
        xi. Airport - Non-editable
            1. Airport Identifier
            2. State
            3. Country
            4. Name
            5. Datum
    b. Video Map Display (VMD)
        i. VMD
        ii. Type
        iii. Associated Runways
    c. No Transgression Zone (NTZ)
        i. VMD
        ii. NTZ Identifier
        iii. Purpose
        iv. Program
        v. Distance CI CI
    d. Comments
        i. Priority
        ii. Topic – Listing.
        iii. Date
        iv. Remark

Airport Navigation Aid Database Application 2.0 (AIRNAV 2.0)

Obstacle Use Cases and Business Rules

Revision History

#	Version	Date	Description	By
1	V00R01	11/21/2007	Draft Version of the Document	Frances K. Hubbard / Vishal Maheshwari
2	V01R00	12/20/2007	First Version of the Document	Frances K. Hubbard / Vishal Maheshwari

Table of Content

1 Introduction

This document fully describes the functionality of Maintain Obstacle module within the AIRNAV 2.0 system. These requirements are captured in the AVN-iSM Use Case format. It details, from a user's perspective, the needs the system must address to capture information related to maintaining the obstacle information in AIRNAV 2.0 system.

This functionality is to be carried in AIRNAV 2.0 until the Obstacle Repository System (ORS) is capable of providing this data through web services. It is only for maintaining current functionality of the existing AIRNAV application.

1.1 Abbreviations and Acronyms

Refer the document AIRNAV - Glossary for abbreviations, acronyms and other general terminology used in the AIRNAV documentation.

2 Use Cases

The Maintain Obstacle module will include following use cases:

1. Search Obstacle
2. Add Obstacle
3. Edit Obstacle
4. View Obstacle
5. Delete Obstacle

The details of each of the above mentioned use cases are described in this document.

2.1 Use Case Specification: Search Obstacle

2.1.1 Brief Description

This use case describes the process of searching for an obstacle record(s) in AIRNAV system.

2.1.2 Actors

Following are the actors for this use case:

1. Data Specialist

2.1.3 Pre – conditions

1. User must be logged in the system as one of the actors mentioned in section 2.1.2 above.
2. User must have the access privileges to search obstacle information.

2.1.4 Basic Flow of Events

1. User invokes the 'Search Obstacle' functionality in the system.
2. System prompts the user to provide the search criteria for searching obstacle, including but not limited to:
    a. Type – Listing.
    b. Identifier
    c. Airport – Listing.
    d. Runway – Listing.
    e. State – Listing.
    f. Country – Listing.
3. User enters a value for any combination of search criterion at the same time and selects to retrieve the records.
4. System displays a complete listing of obstacle records, which satisfy the user entered search criteria, sorted by their type and identifier within type in a tabular format. The information displayed for each obstacle will be:
    a. Type
    b. Airport
    c. Runway
    d. Identifier
    e. State
    f. Country
5. If no user records satisfy the user entered search criteria, system displays an appropriate message to the user.

2.1.5 Alternate Flows

There are no alternate flows in this use case.

2.1.6 Sub – flows

There are no sub-flows for this use case.

2.1.7 Key Scenarios

There are no key scenarios for this use case.

2.1.8 Post – conditions

There are no post conditions for this use case.

2.1.9 Extension Points

There are no extension points for this use case.

2.1.10 Special Requirements

1. Refer to Business Rules section and Supplementary Specifications for requirements related to obstacle.

2.1.11 Additional Information

There is no additional information for this use case.

2.1.12 Business Rules

1. For each Obstacle record in the search result, system will provide an ability, for users with appropriate access privileges, to directly navigate to:
    a. edit display of that obstacle record
    b. view display of that obstacle record
2. On the search result, the system will provide an ability to directly navigate to the add obstacle display for users with appropriate access privileges.

2.2 Use Case Specification: Add Obstacle

2.2.1 Brief Description

This use case describes the process of adding an obstacle record.

2.2.2 Actors

Following are the actors for this use case:

1. Data Specialist

2.2.3 Pre – conditions

1. User must be logged in the system as one of the actors mentioned in section 2.2.2 above.
2. User has conducted 'Search Obstacle' process and found no matching records.
3. User must have the access privileges to add obstacle information.

2.2.4 Basic Flow of Events

1. User selects to navigate to the add display.
2. System prompts the user to enter the information, including but not limited to, for the obstacle:
    a. General Information
        i. Obstacle Identifier
        ii. Obstacle Type - Listing
        iii. Description - Mandatory information.
        iv. State - Listing.
        v. Country - Listing.
        vi. Location Error
        vii. Height Error
        viii. FAA Study Number
        ix. Survey Date
        x. Marked Indicator - Listing.
        xi. Changed Date
        xii. Verified Indicator - Listing.
        xiii. Source
        xiv. Effective Date - Mandatory information. Listing.
        xv. Effective End Date
        xvi. DOF Original ID
    b. Airport
        i. Identifier - Listing
        ii. Bearing
        iii. Distance
    c. Comments
        i. Priority
        ii. Topic - Listing.
        iii. Date
        iv. Remark
    d. Coordinates
        i. Latitude
        ii. Longitude
        iii. MSL Elevation
        iv. AGL Elevation
        v. Horizontal Datum - Listing.
        vi. Vertical Datum - Listing.

e. Runways
    i. Number - Listing.
3. User enters the information and selects to save the obstacle record in the system.
4. System adds the obstacle record and displays an appropriate message to the user.
5. If the system fails to add the obstacle record with the information as entered by the user, system displays an appropriate message to the user.

2.2.5 Alternate Flows

There are no alternate flows in this use case.

2.2.6 Sub – flows

There are no sub-flows for this use case.

2.2.7 Key Scenarios

There are no key scenarios for this use case.

2.2.8 Post – conditions

1. A new obstacle record is added to the system and is searchable.

2.2.9 Extension Points

There are no extension points for this use case.

2.2.10 Special Requirements

1. Refer to Business Rules section and Supplementary Specifications for requirements related to obstacle.

2.2.11 Additional Information

There is no additional information for this use case.

2.2.12 Business Rules

1. System will provide an ability, for users with appropriate access privileges, to:
    a. navigate back to search display from the add display without adding a new record.
    b. clear the entire user entered information and any dependent information before record is added to the system.
2. The attribute 'Runways → Number' will be populated by System based on the Airport Identifier selected by the user.
3. System will allow associating multiple runways with an obstacle record.

2.3 Use Case Specification: Edit Obstacle

2.3.1 Brief Description

This use case describes the process of editing an existing obstacle record.

2.3.2 Actors

Following are the actors for this use case:

1. Data Specialist

2.3.3 Pre – conditions

1. User must be logged in the system as one of the actors mentioned in section 2.3.2 above.
2. User has conducted 'Search Obstacle' process and selected an obstacle record for editing.
3. User must have the access privileges to edit obstacle information.

2.3.4 Basic Flow of Events

1. User selects to navigate to edit display for a particular obstacle record.
2. System displays the selected obstacle record in the edit mode.
3. User makes the necessary changes to the record information and selects to save the changed obstacle record in the system.
4. System saves the obstacle record with the changed information and displays an appropriate message to the user.
5. If the system fails to save the obstacle record with the changed information as entered by the user, system displays an appropriate message to the user.

2.3.5 Alternate Flows

There are not alternate flows for this use case.

2.3.6 Sub – flows

There are no sub-flows for this use case.

2.3.7 Key Scenarios

There are no key scenarios for this use case.

2.3.8 Post – conditions

1. A changed obstacle record is saved to the system and is searchable based on the changed information.

2.3.9 Extension Points

There are no extension points for this use case.

2.3.10 Special Requirements

1. Refer to Business Rules and Supplementary Specifications for requirements related to obstacle.

2.3.11 Additional Information

There is no additional information for this use case.

2.3.12 Business Rules

1. System will provide an ability, for users with appropriate access privileges, to
    a. navigate back to search display from the edit display without making any changes to the selected record.
    b. cancel the changes made by user to the record before the changed record is saved to the system.
2. Refer to Business Rules section of the use case: 'Add Obstacle' for other requirements.

2.4 Use Case Specification: View Obstacle

2.4.1 Brief Description

This use case describes the process of viewing an existing obstacle record.

2.4.2 Actors

Following are the actors for this use case:

1. Data Specialist

2.4.3 Pre – conditions

1. User must be logged in the system as one of the actors mentioned in section 2.4.2 above.
2. User has conducted 'Search Obstacle' process and selected an obstacle record for viewing.
3. User must have the access privileges to view obstacle information.

2.4.4 Basic Flow of Events

1. User selects to navigate to view display for a particular obstacle record.
2. System displays the selected obstacle record in the view mode.

2.4.5 Alternate Flows

There are no alternate flows in this use case.

2.4.6 Sub – flows

There are no sub-flows for this use case.

2.4.7 Key Scenarios

There are no key scenarios for this use case.

2.4.8 Post – conditions

There are no post-conditions for this use case.

2.4.9 Extension Points

There are no extension points for this use case.

2.4.10 Special Requirements

1. Refer to Business Rules section and Supplementary Specifications for requirements related to obstacle.

2.4.11 Additional Information

There is no additional information for this use case.

2.4.12 Business Rules

1. System will provide an ability, for users with appropriate access privileges, to:
    a. navigate back to search display from the view display.

2.5 Use Case Specification: Delete Obstacle

2.5.1 Brief Description

This use case describes the process of deleting an existing obstacle record. The delete here refers to the physical deletion of the obstacle record.

2.5.2 Actors

Following are the actors for this use case:

1. Data Specialist

2.5.3 Pre – conditions

1. User must be logged in the system as one of the actors mentioned in section 2.5.2 above.
2. User has conducted 'Search Obstacle' process and selected an obstacle record for deleting.
3. User must have the access privileges to delete obstacle information.

2.5.4 Basic Flow of Events

1. User selects to delete a particular obstacle record from AIRNAV.
2. System deletes the selected obstacle record from the system and displays an appropriate message to the user.
3. If the system fails to delete the selected obstacle record, system displays an appropriate message to the user.

2.5.5 Alternate Flows

There are no alternate flows for this use case.

2.5.6 Sub – flows

There are no sub-flows for this use case.

2.5.7 Key Scenarios

There are no key scenarios for this use case.

2.5.8 Post – conditions

1. The selected obstacle record will be deleted from the system.
2. The deleted obstacle record will not be searchable in the system.

2.5.9 Extension Points

There are no extension points for this use case.

2.5.10 Special Requirements

1. Refer to Supplementary Specifications for requirements related to obstacle.

2.5.11 Additional Information

There is no additional information for this use case.